Ontario fish and wildlife Review

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Everybody talks about you-know-what, and now Ronald Reid reports on the people who have done something about it. Be prepared for some surprises.

Author Barwell believes hunters should know the age and sex of their ducks, and he tells how to make quick identifications in the field. Cover duckscape by Cees Van Gemerden. Colour photo guides on centre spread.

When Shan Walshe reported the interesting things that happen on his window bird feeder, he was district naturalist at Fort Frances, and his home was eight miles to the east on the north shore of Rainy Lake. Extra photos on back cover.

Great balls of fur! Dave Watton contributes his first Where to Find, and Authors Nepszy and Leach have another 'first' from Lake Erie.

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fish and wildlife
Review

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CONTENTS PAGE

Snowmobiles and the Environment 3
by Ronald A. Reid

Hints for Duck Hunters 7
by C. K. Barwell

Why Not Set Up a Winter Bird Feeder? 15
by Shan Walshe

Chinese Mitten Crabs in Lake Erie 17
by S. J. Nepszy and J. H. Leach

Where to Find Cottontail Rabbits in Ontario 19
by D. G. Watton

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The goal of the Ministry of Natural Resources is to provide opportunities for outdoor recreation and resource development for the continuous social and economic benefit of the people of Ontario, and to administer, protect and conserve public lands and waters.

Ontario
Ministry of
Natural
Resources

Hon. Leo Bernier
Minister

W. Q. Macnee
Deputy Minister

EDITORIAL

Management by Sub-Population

TO MANAGE wildlife effectively, biologists must first determine the population status of a species, either on a continental or regional basis. The problems associated with censusing most wildlife species are complex and involve difficulties in assessing natural mortality, harvest, dispersal of animals, and habitat deterioration.

For management purposes, a census of the entire population is unnecessary in most cases. Usually, a segment of the population is the target.

In waterfowl, for instance, the most important individuals are the breeding females. They virtually always return to breed in the vicinity where they were reared, whereas the male rarely returns to his natal area. For example, on Lake Nipissing, breeding female mallards return every year while the male component changes annually.

Thus, the portion of the population important for management purposes comprises females. Furthermore, only a fraction of these are capable of rearing young successfully. The most productive are typically the older birds. Inexperienced one-, or two-year-old females, whether they be ducks, geese, swans or even grouse, are relatively unproductive and in many cases occupy territories to the exclusion of older, more productive females.

Evidently, old, adult females are the most important segment of the population and, for management purposes, should be considered "the population".

It is unfortunate that current management depends heavily on gross population figures even though a large number of censused animals may be extraneous and their presence misleading.

In Europe, it may be noted, wildlife management for years has stressed the preservation of a specific age-class or sex-class or, in some instances, specific social groups.

Management by sub-population means that seasons and bag limits must be imposed on specific groups such as hen mallards. This, however, would call for a higher level of expertise on the part of the hunter in identifying these birds on the wing.

Are we ready to make this extra effort for better management?

— R. M. Alison

When it's cold, that's when some like it hot.

SNOWMOBILES AND THE ENVIRONMENT

by Ronald A. Reid
Conservation Authorities Branch
(Drawing by the Author)

DURING the past decade, the most outstanding development in recreation has been the phenomenal growth in the popularity of snowmobiles. An estimated two million snowmobiles are active in North America, and over 250,000 are located in Ontario. The outdoor recreation derived from snowmobiling is desirable while the economic benefits to associated industries and tourism are considerable.

However, not all aspects of this new activity are beneficial. Numerous complaints have been voiced, by participants and non-participants alike, about noise, safety hazards, vandalism, littering, incompatibility with other winter recreation, and damage to the environment.

Most of these problems can be readily demonstrated, but the environmental issue is not so clear-cut. In this area, judgements are often coloured by emotion, and values are defined on a relative, rather than a discrete, basis. In the past, judgements have been hampered by the lack of reliable scientific data, but recent studies have done much to clarify many areas of environmental concern.

The alterations in snow characteristics, brought about by snowmobile traverse, are the basis of many other environmental changes. An understanding of these effects on snow cover is necessary for the interpretation of secondary effects.

The average depth of snow beneath a snowmobile track is reduced considerably below normal, and the temperature conductivity of the compacted snow is increased from four to nine times. These two factors result in abnormally low temperatures and continually frozen ground beneath a snowmobile track. Beneath the compacted snow, temperature differences of 8° C below normal have been recorded 15 cm (six inches) under the soil surface.

Snow compacted by snowmobiles is significantly denser than normal, and its capacity to hold free water is reduced by up to 70 per cent. Finally, melting of the compacted snow, and subsequent warming of the ground, is delayed from ten days to three weeks in the spring.

Vegetation can be affected by snowmobile traverse either by temperature changes or by direct physical damage. The lower soil temperatures and delayed spring warming either retard or inhibit altogether the growth and blooming of early spring plants. Herbaceous perennials with large underground storage organs, such as Jack-in-the-pulpit and marsh marigold, appear to be the most affected.

Under snowmobile compaction, alfalfa shows typical winter-kill symptoms, with total production lowered one-third at the time of normal cutting, and with coarse, poor-quality stems predominating. Moreover, weeds and grasses among the alfalfa increase up to 61 per cent above their usual occurrence.

The damage to woody plants usually occurs as direct breakage from the weight of the snowmobile. Young conifers trampled by snowmobiles showed from 50 to 70 per cent damage, with the first-year mortality at eight to ten per cent. White spruce appeared to be particularly affected, with red pine and other conifers close behind.

Hardwood saplings and shrubs are similarly damaged, but the species which readily form sucker growth are actually promoted. Species which have responded positively include maple, oak, raspberry and serviceberry. On the other hand, serious declines have been shown in basswood, aspen, and hazel-nut.

As might be expected, interactions between snowmobiles and wildlife are varied and complex. The effects of snowmobiles on white-tailed deer have been the subjects of much speculation and controversy, but recent radio-telemetry work in Minnesota has clarified the issues to a considerable extent. In Minnesota, researchers found that moderately heavy snowmobiling in a deer yard causes a restriction in daily deer movement and a significant reduction in daily home-range size. Also, the deer tend to be pushed out of conifer cover into deciduous areas where their heat loss is greater. This increased cold stress, combined with limited browsing efficiency, could be significant during cold spells.

The use of snowmobile trails as travel lanes does occur during periods of deep snow or drifting, but only if snowmobile traffic is low. The use of snowmobile trails by most other wildlife has not been firmly established. Snowshoe hare appear to avoid the trails.

The drastic reduction in temperature beneath snowmobile trails has been shown to cause a marked increase in the mortality of mice and voles, presumably from cold stress. In addition, the compacted snow is too dense for burrowing, and these small mammals are forced to cross snowmobile trails above the snow where they are much more vulnerable to predation.

The impact of snowmobiles on the environment cannot be completely evaluated unless we also consider the human element. For example, the deliberate harassment of wildlife by snowmobilers may be a significant problem. In some districts, the new access to previously unused lakes in remote areas has resulted in over-fishing and enforcement problems. And finally, as with most recreational activities, litter has become an aesthetic problem.

On the other hand, snowmobiles have made possible a more intensive and useful management of big game. For example, they allow easier access to white-tailed deer yards.

In assessing the impact of snowmobiles on the environment, one of the most interesting factors to note is that most of the effects are caused by the initial passage. Repeated passage may affect large mammals significantly but has relatively little additional effect on such factors as subnivean temperatures or vegetation damage.

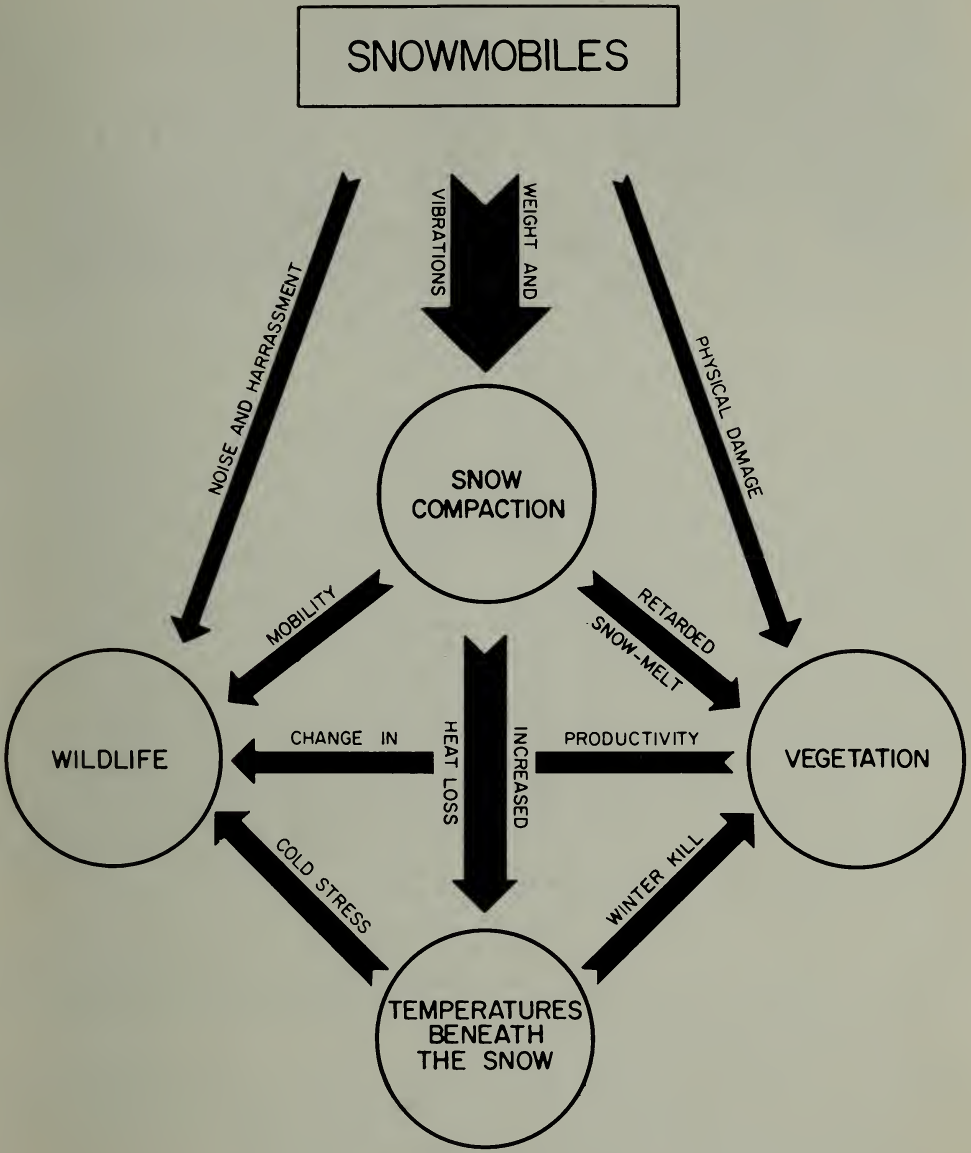
The magnitude of snowmobile effects is modified to some extent by depth of snow, type of snow structure, and type of soil below the snow.

One of the major reasons for concern over the environmental impact of snowmobiles stems from their mobility over roadless terrain. A snowmobile can cover hundreds of miles of formerly untouched country during a day. However, as far as soil and vegetation are concerned, the resulting changes are limited to the narrow swath directly beneath the snowmobile track. This simple fact makes it relatively easy to define snowmobile damage to soil and vegetation.

The effect on wildlife is not so easily determined. Most species of wildlife are already under their greatest stress during the winter months because of food shortages and low temperatures. Furthermore, the influence of snowmobiles extends for some distance beyond the trail. The compaction of snow on the travel tunnels of small rodents forces these animals to move above the snow for a sizeable distance; and large animals are disturbed at a considerable distance from the snowmobile trail.

Does the snowmobiler, himself, realize the ecological effects resulting from his machine? A study in Minnesota revealed that 75 per cent of sampled snowmobilers rated snowmobiling as either beneficial to the environment or as having little or no effect. In striking contrast, snowmobiling was rated as harmful by 83 per cent of downhill skiers and by 95 per cent of winter campers and cross-country skiers and snowshoers. However, only 50 per cent of non-motorized winter recreation groups favoured regulation of snowmobiles in the interest of wildlife or the environment, while nearly 40 per cent of the snowmobilers favoured such regulation.

In conjunction with other factors such as safety and accessibility, the ecological effects of snowmobiling must become a



ECOLOGICAL INTERACTIONS RESULTING FROM SNOWMOBILES

Snowmobiles transport some people to outdoor living.

consideration in the control of this recreational activity. This control should be twofold: delineation and zoning of prohibited areas; and establishment of snowmobile trails in ecologically "safe" areas.

The delineation of prohibited areas can be derived from Canada Land Inventory maps, reforestation maps, aerial photographs, and available data on known deer yards and unique natural areas, as well as field checking. The routing of trails could follow similar procedures with heavier emphasis on field analysis to locate potential trouble spots.

The possibilities of the use of snowmobiles for deliberate ecological manipulation poses interesting questions for the future. The control of small rodents in orchards by snowmobile traverse could be looked into, as could the stimulation of suckering and shrub growth. The judicious use of snowmobiles to create trails in deer yards may also prove useful.

Certainly, a wide-range program to examine the primary and secondary effects of snowmobiles under various conditions could hold great value. Until more such data are made available and assessed, we should carefully control this recreational activity.

REFERENCES

Huff, D. E. and P. J. Savage, 1972. A correlation of deer movements with snowmobile activity in Minnesota during winter, 1972. 34th Midwest Fish and Wildlife Conference, Des Moines, Iowa.

Jarvinen, J. A. and W. D. Schmid, 1971. Snowmobile use and winter mortality of small mammals. In: Proceedings of the 1971 Snowmobile and Off-the-Road Vehicle Research Symposium, East Lansing, Michigan. PP. 130-141.

Neumann, P. W. and H. G. Merriam, 1971. Ecological effects of snowmobiles. The Canadian Field-Naturalist 86: 207-212.

Schmid, W. D., 1971. Modification of the subnivean microclimate by snowmobiles. In: Proceedings of the Snow and Ice in Relation to Wildlife and Recreation Symposium. Iowa Co-operative Wildlife Research Unit, Iowa State University, PP. 251-257.

University of Minnesota and Minnesota Department of Natural Resources, 1972. Wildlife — Snowmobile Interaction Report. 34 pp.

Wanek, W. J., 1972. A continuing study of the ecological impact of ·snowmobiling in Northern Minnesota. Bemidji State College, Bemidji, Minnesota. 21 pp.

HINTS FOR DUCK HUNTERS

by C. K. Barwell
Conservation Officer, Lindsay District

DURING the winter months, members of the duck hunting fraternity spend many hours discussing their hunting experiences. They tell of the good hunts and what made them good. They talk about methods of calling, new types of decoys and so on. Each hunter picks up a tip and spends part of the long winter nights making decoys, painting old decoys, practising calling, or just dreaming of past hunts and planning next season's excursions.

These traditional pursuits are enjoyable, but why not add a new and interesting project — waterfowl age and sex identification.

Ontario duck hunters harvested approximately 815,000 ducks during the 1972 waterfowl season. How many hunters knew the sex and age of the birds killed?

Most hunters knew they shot a mallard or a teal, but was it a male or a female? Was it a juvenile or an adult? How many hunters could answer these questions?

Here are a few field methods for determining quickly and accurately the age and sex of the most common species taken in Ontario.

First, it must be understood that during the summer the male duck loses his beautiful mating plumage (this is called "eclipse plumage") and looks very much like the female, making it difficult to distinguish the sexes.

The age of most species may be determined by one of two methods. The easier one is observation of the tail feathers which in the adult bird (older than ten months) appear new and show smooth edges with a shapely pointed tip On the immature or juvenile duck (hatched during the year), the tail feathers have a very ragged appearance with the tip of the feather being notched. (Fig. 1) If only one feather is notched, the bird is a juvenile.

The difference in tail feather structure occurs because the mature bird has replaced its tail feathers, while the immature duck still has its first set of feathers to which the down was attached. The down has broken off, giving the notched effect. As the young bird replaces its feathers with winter plumage, the notched feathers are gradually moulted. Thus, the number of notched feathers will vary with the rate at which the bird is moulting.

On most species, the wing feathers may also be used for aging, but due to the complexity of this method, it is rarely used in the field.

The examination of the sex organs of ducks enables the examiner to determine age as well as sex. This examination is made by spreading the vent with the thumb and first finger.

The immature duck has a penis that is shaped like a little worm with a black head. In contrast, the adult penis is much larger and is enclosed in a conspicuous white sheath.

In the adult female, the opening of the oviduct is visible on the left side of the vent. The juvenile female has a membrane covering the opening, making it difficult to see.

A simple way to determine the sex of mallard and black ducks is to observe the spotting pattern on the upper half of the bill. Females of these species show dark spots and/or dusky markings. On the male, there are no spots, but a dark line may run down the centre of the upper bill. (Photos No. 3 and 4)

The hen mallard can be distinguished from the drake quite easily by looking at the white border on the top of the blue speculum. These feathers are called the 'greater coverts' (Fig. 2). If the white bar extends partially beyond the speculum and over the tertial feathers, the bird is a female.

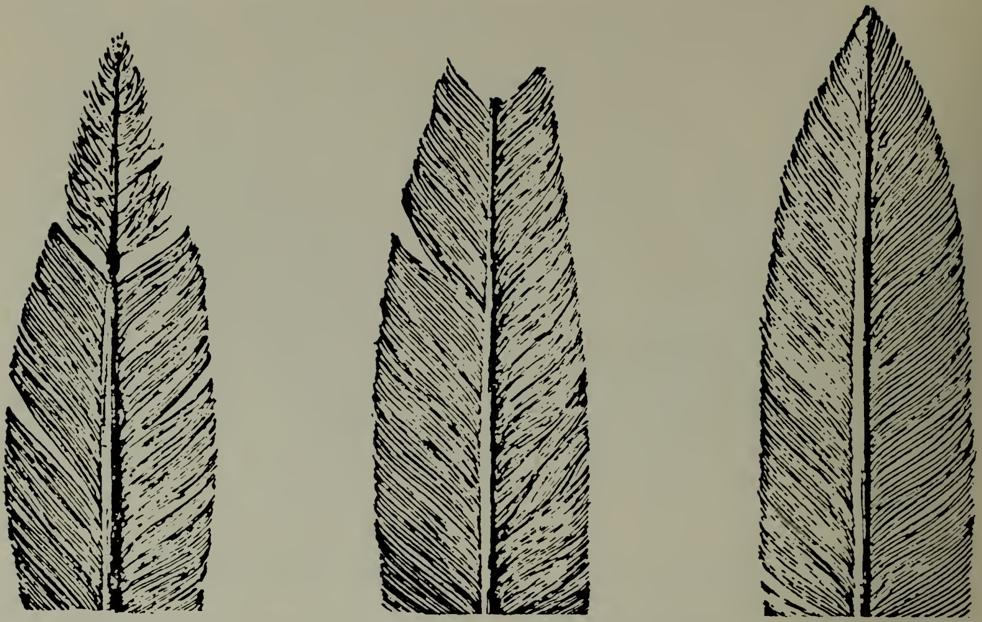


Figure 1. The tail feathers of adult ducks appear new and show smooth edges with sharply pointed tips (as right, above). On immature ducks, the tail feathers appear ragged. If only one feather is notched, the bird is a juvenile.

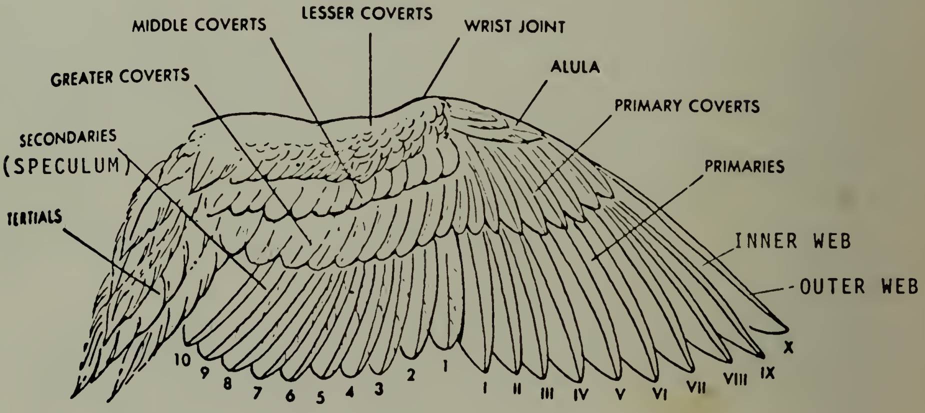


Figure 2. Diagram of mallard wing showing the position of the feathers.

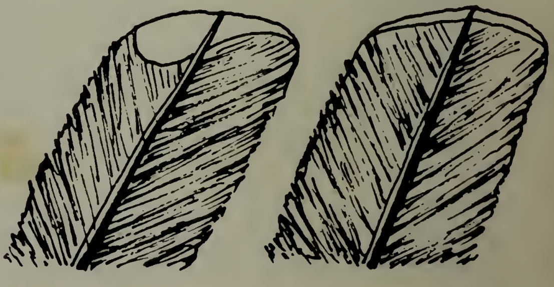


Figure 3. On the trailing edge of the secondaries on a female wood duck, the white is much wider on the outer web, usually in a tear-drop form (first, right). On the male, the white is approximately the same width on both webs of the feather (far, right).

DUCK IDE

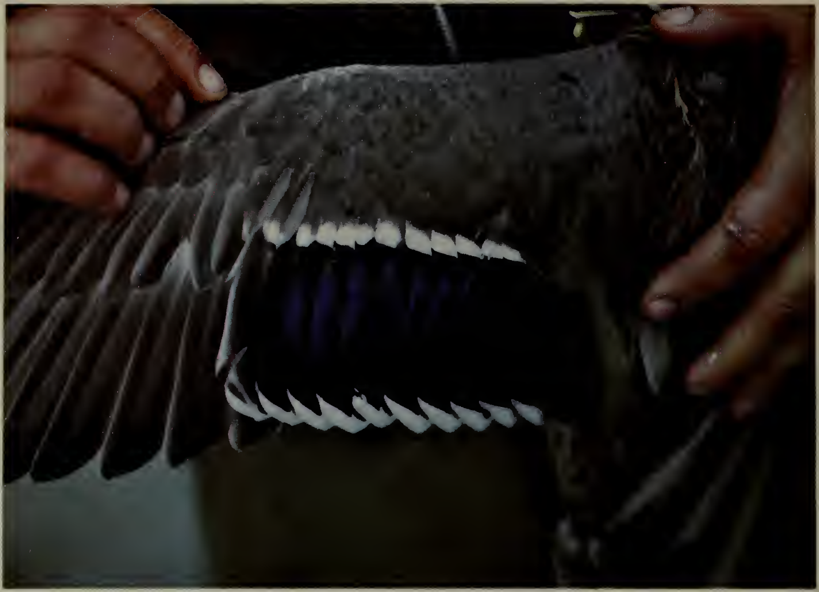


Photo 1. On a male mallard, the white border on the top of the blue speculum does not extend beyond the speculum.

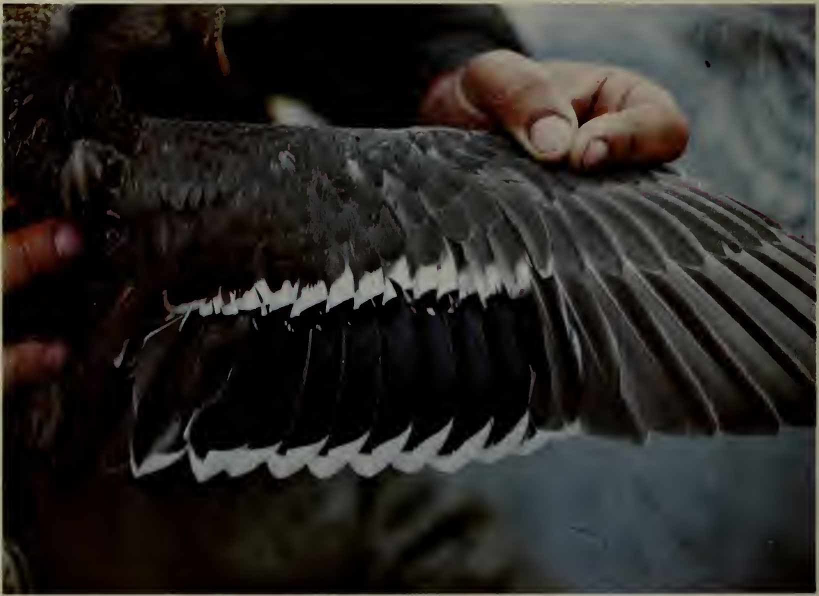


Photo 2. On a female mallard, the white border (above the speculum) extends partially over the tertial feathers.

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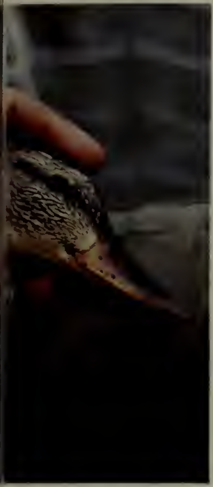

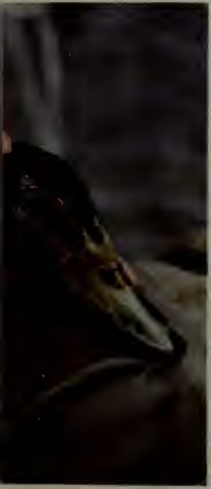

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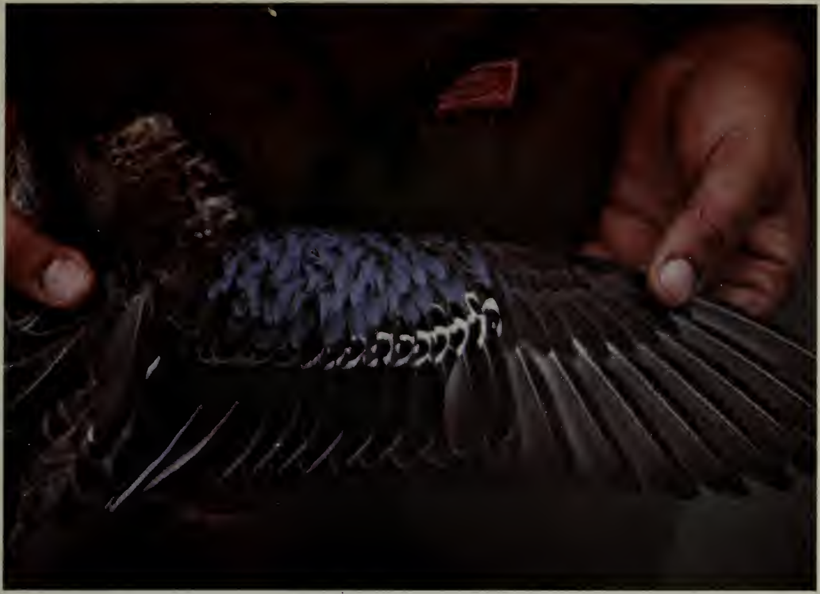


Photo 5. On a female blue-winged teal, the greater coverts show blue spots, bordered with white, giving a tear-drop effect. The amount of white is usually small and may be nil. Both sexes may have black spots on the bill.

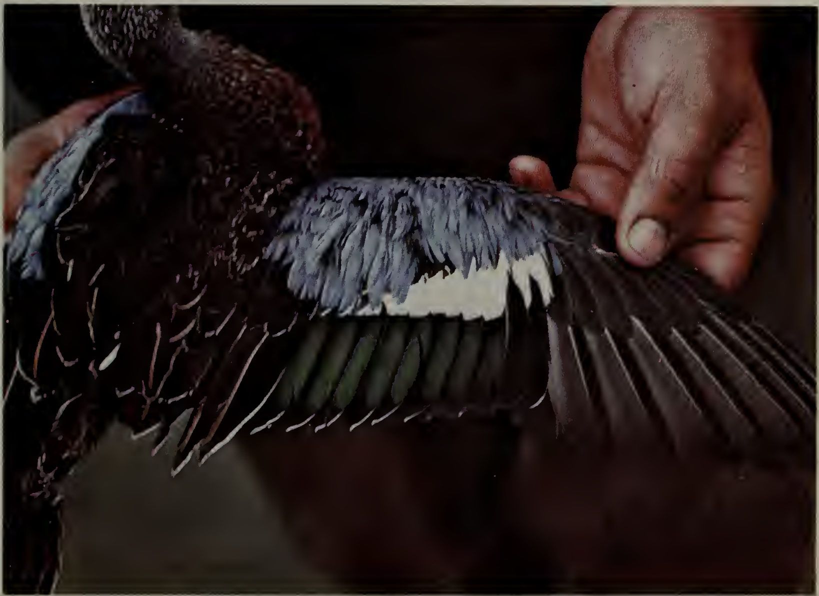


Photo 6. On a male blue-winged teal, the greater coverts are a solid white.

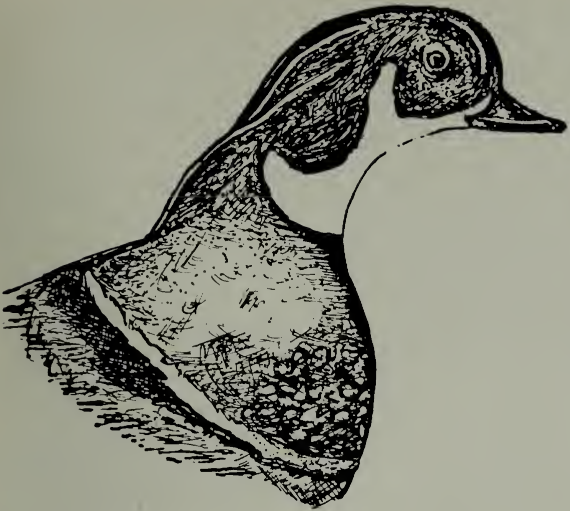


Figure 4. A male wood duck has two distinct white markings — up the back of the head, and up the side of the head.

The white on the male stops abruptly with the speculum (Photo No. 1). Photo No. 2 shows the female with the white extending.

One of the ducks commonly taken by hunters in Ontario is the blue-winged teal which is easily identified by its blue shoulder patch. Its sex may also be determined by looking at the greater coverts (Fig. 2). These coverts are a solid white on the male, while the female has a blue spot bordered with white, which gives a tear-drop effect. The white in the female will vary in amount but is usually very slight and may be almost nil (Photos No. 5 and 6). There may be black spots on the bills of both males and females.

Wood ducks are common in the wooded areas of Ontario, and many are taken by hunters during the waterfowl season. The male has two distinct white markings — up the side of the head and up the back of the head (Fig. 4). These markings are absent in the female.

The wing plumage also may be used for determining the sex of woodies. The trailing edge of the secondaries (Fig. 2) is white on both male and female. In the female, the white is much wider on the outer web, usually in a tear-drop form. The white on the male is approximately the same width on both webs of the feather (Fig. 3).

The above are the four most common ducks taken by Ontario hunters each fall. Let us recap what to look for.

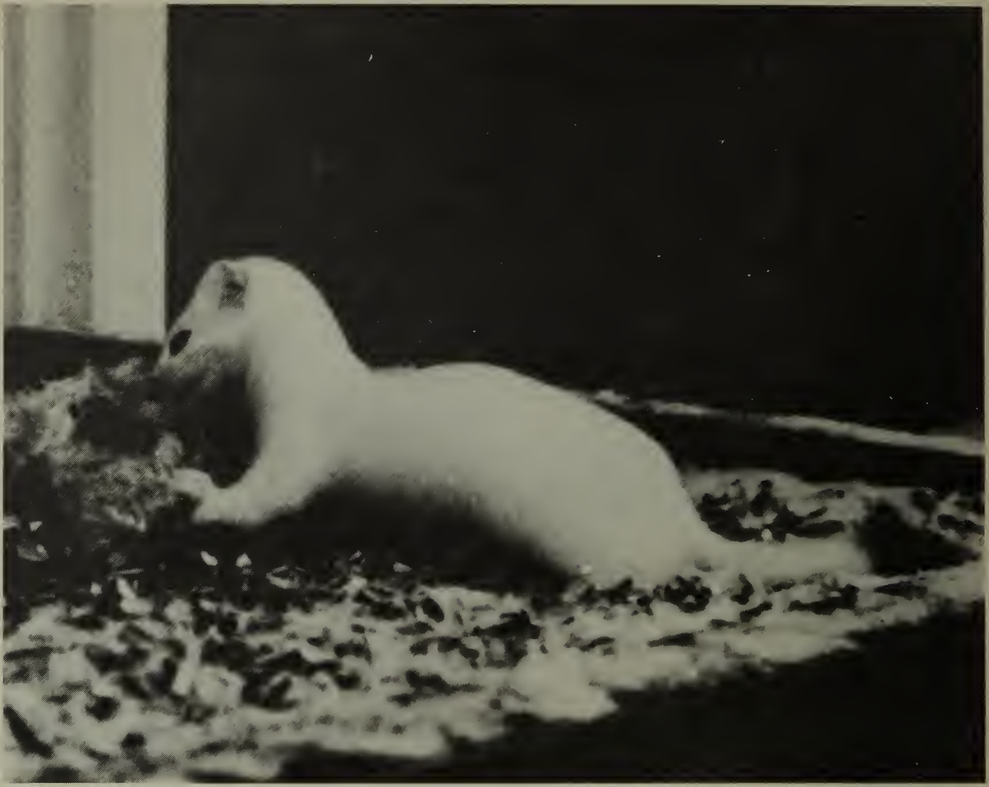
Mallard	Tail feathers for age Bill markings and greater coverts for sex
Black duck	Tail feathers for age Bill markings for sex
Blue-winged teal	Tail feathers for age Secondary coverts for sex
Wood duck	Tail feathers for age Secondaries for sex Throat markings for sex

Take the time to age and sex the birds you harvest, and you'll add a new dimension to your hunting experience.

REFERENCES

Preliminary Keys to Waterfowl Age and Sex Identification by Means of Wing Plumage. Specific Scientific Report, Wildlife No. 82. U.S.A. Dept. of Interior. (May be obtained by writing.)

Kortright, Francis H. The Ducks, Geese and Swans of North America. Published by The Stackpole Co. of Harrisburg, Penn., and Wildlife Management Institute, Washington, D.C.



An ermine captivates its window audience. Photo by D. J. Haddow.

WHY NOT SET UP A WINTER BIRD FEEDER?

by Shan Walshe
District Naturalist, Atikokan

I'VE never had such a good look at a flying squirrel in my life, said our guest as he sat in our kitchen chair, carefully examining this extremely interesting nocturnal animal from a distance of less than six inches. The eyes with their huge pupils, the characteristic folds of skin which stretch on either side from the foreleg to the hind leg, and the smooth well-rounded tail stood out clearly in the light shining through the window onto the shelf feeder.

I explained that we were quite fortunate to be paid regular nightly visits by a pair of flying squirrels and that, during the breeding season in late winter, we had had as many as five of these unusual animals frolicking about on the feeder at the same time.

One night in January, my wife, children and I watched spellbound as a short-tailed weasel (ermine) tugged on a large piece of chicken carcass. Though it was fully four times larger than itself, the weasel, muscles of spring steel straining, eventually succeeded in inching it to the edge of the feeder where it fell to the ground. A short time later, noises from beneath the living room floor indicated that the weasel had found a hiding place for its tasty gallinaceous meal.

These were only two of the many thrilling and educational experiences that the possession of a 'bird' feeder has given us. At a time when modern technology and urban living are isolating us from the natural environment, it is vital that we engage in at least a few activities which will renew our understanding of nature and instil it in our children. Observing the characteristics, habits and adaptations of the many species of birds and mammals which frequent a feeder is an excellent way for all members of the family to maintain a close relationship with the natural world.

For close observation of both diurnal and nocturnal birds and mammals, no feeder is quite as satisfactory as the shelf type. It consists of a sheet of half-inch plywood as long as the width of the window and about two and a half feet wide. A frame of 2" x 2" lumber is nailed on the three outer edges to prevent seed from falling to the ground. Half-inch holes are drilled at intervals of about six inches over the plywood to allow water to drain away.

One side of the plywood sheet is nailed to the window sill, and the two outside corners are secured to the house wall with guy wires.

It is recommended that the chosen window be of the picture type and of two-layer (thermopane) construction to prevent steaming and frosting in cold weather. It should be situated on the lee side of the house, away from the prevailing wind.

In urban areas and open farmland, English sparrows, starlings and pigeons are by far the most frequently-encountered winter birds. Many types of feed grains and table left-overs are suitable for such species. The grains include wheat, oats, barley and cracked corn. Do not feed white bread scraps or crumbs exclusively as these do not provide an adequate diet.

Wild birds, normally found in less-disturbed wooded or semi-wooded areas, are more discriminating in their diet than species that frequent settled areas. Most of the former will not even look at the feed grains mentioned above.

From late fall to late winter, sunflower seed is eaten by more species of birds and small mammals than any other type of feed. In the Fort Frances area, it attracts the evening grosbeak, pine grosbeak, red crossbill, blue jay, black-capped chickadee, red squirrel, and northern flying squirrel. For economic reasons, sunflower seed should be purchased in bulk.

A small quantity of millet should be put out for the occasional flock of redpolls which turns up from time to time throughout the winter. When migration starts in early spring, the ration of millet should be increased enormously for it is the favourite food of many small birds.

Each April and May at our cottage on the north shore of Rainy Lake, eight miles east of Fort Frances, we are besieged by huge flocks of slate-coloured juncos, tree sparrows, white-crowned sparrows and white-throated sparrows, all clamouring for food. These are often joined by a fair number of song sparrows, chipping sparrows and Harris' sparrows, and an occasional fox sparrow.

Hairy and downy woodpeckers, chickadees and gray jays (whisky jacks) readily consume any sort of animal fat provided it is free of salt. (For this season, bacon drippings and frying pan grease in general are not recommended.) Large chunks of waste fat, trimmed from animal carcasses, can usually be obtained free of charge at butcher shops. Simply fill a mesh-type onion bag with fat and tie it to a tree high enough to be out of reach of dogs.

To attract weasel, mink, marten, fisher, fox and lynx, save all waste meat scraps and bones. Coarse fish can often be purchased from a commercial fisherman for a few cents a pound (winter use, only). Scatter this food both on the ground in front of your window and on the feeder, itself.

Be patient. It may take some time for an animal to locate your profferings and become accustomed to the strange surroundings. Persevere and don't stop trying — last fall, using this method, we tamed a fox to the point where he would come at our call and follow us like a dog.

One word of warning — never attempt to tame a bear! It is foolhardy to encourage such a powerful and unpredictable animal. Once it has lost its fear of man, the bear becomes extremely bold and dangerous, often causing extensive damage to buildings, boats, tents, etc. When, inevitably, it has to be shot, the person who tamed it must bear the blame.

As with many people in this rapidly changing, chaotic modern world, circumstances have compelled us to move all too frequently through the years. The myriad tasks associated with the restoration of order to a disrupted household cause us to postpone, for a time, the construction of a new feeder. Then, surveying through the window the empty, lifeless landscape, we come to realize just how much the sight of yellow grosbeaks, scurrying red squirrels and snow-white ermine helps a house-bound family survive the long, monotonous, northern Ontario winters.

WILDLIFE SIGHTINGS AT RAINY LAKE FEEDING STATION

NOV. 6 — FEB. 4

Regular Visitors

Evening grosbeak	approx. 30 daily
Black-capped chickadee	5 daily
Blue jay	5 daily
Downy woodpecker	2 daily
Hairy woodpecker	2 daily
Red squirrel	4 daily
Northern flying squirrel	2 daily
Short-tailed weasel (ermine)	1 daily

Occasional Visitors

Pine grosbeak — Four birds appeared in November, returning on four consecutive days.

Red cross-bill — Two females came daily for two weeks in January.

Grackle — One immature remained at the feeder for two weeks in January.

Common redpoll — One was seen a few times in December. A flock of about 20 arrived on Feb. 2 and were still with us, February 4.

Gray jay — An occasional visitor throughout the winter. Has appeared more frequently since a box of moose bones was placed near the feeder two weeks ago.

Northern shrike — Seen about six times this winter. Its presence can inevitably be detected by observing motionless chickadees clinging like statues to feeder guy wires.

CHINESE MITTEN CRABS IN LAKE ERIE

by S. J. Nepszy and J. H. Leach
Research Scientists, Fish and Wildlife Research Branch

WITHOUT benefit of passport or fanfare, three foreign visitors made an unscheduled stop in Lake Erie. The recent visitors, known commonly as Chinese mitten crabs and more formally as *Eriocheir sinensis,* were captured alive by commercial gillnetting gear in Lake Erie near Erieau and Port Stanley during April and May, 1973.

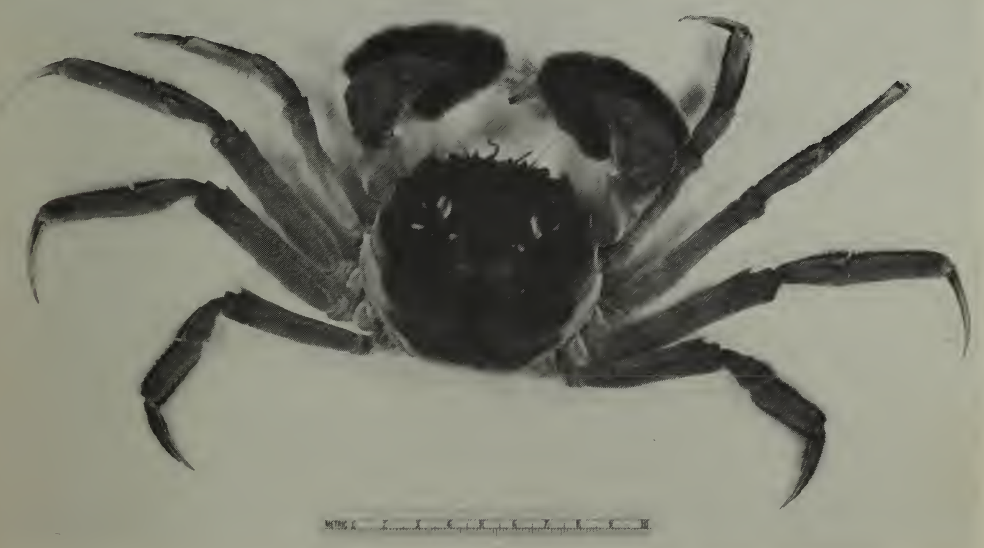
The crabs were brought to the Lake Erie Fisheries Research Station at Wheatley, and they were maintained alive — up to 43 days in one case — in an aquarium. Their identification as Chinese mitten crabs was confirmed by staff at the Royal Ontario Museum.

The Chinese mitten crabs, so called because of their characteristic mass of hairs around the joints of the two front pincers, measured about two and three-quarter inches across the carapace (or body) as indicated in the accompanying photograph. They are native to southeastern Asia but have spread to various parts of Europe and now, perhaps, to North America.

The crab was first recorded in Europe in the River Weser of Germany in 1912. By 1927, it had been observed in European rivers up to 650 kms (400 miles) from the sea. Since 1935, it has spread throughout the Baltic and down the west coast of Europe to the south of France.

Adult crabs spend most of their time in the freshwater medium but return to the sea or brackish water to reproduce. Soon after hatching, the young begin to migrate upstream. In Germany, they regularly travel from 600 to 700 kms (360 to 420 miles) up the River Elbe, and in China they travel equal distances up the Yangtze Kiang. Their predominant food is aquatic vegetation, but they also feed on molluscs, insect larvae, other crabs, and netted and dead fish.

Although the occurrence of this creature is a first record for Lake Erie, it is not the first in the vicinity. In 1965, a mitten crab was reported taken from the water intake



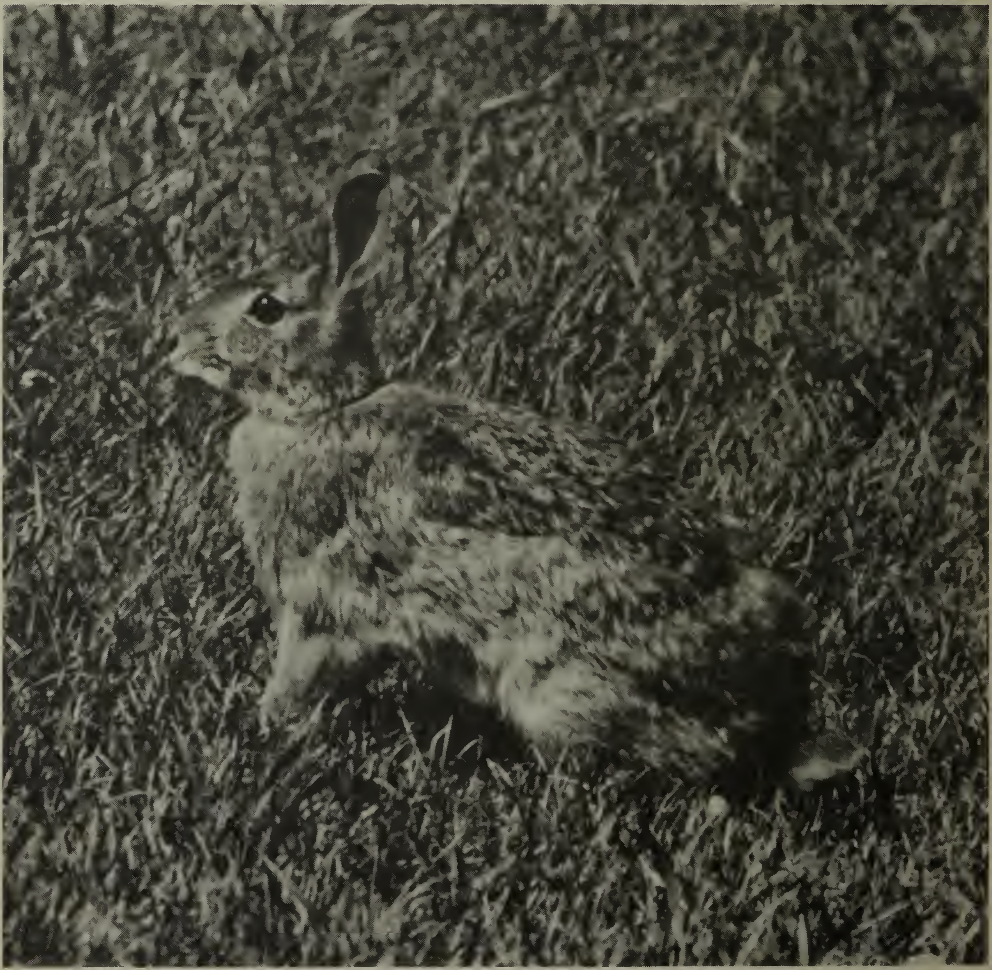
Chinese mitten crab; the metric rule indicates its size. Photo by Jean Robinson.

pipe of the City of Windsor opposite Belle Isle in the Detroit River.

It is difficult to ascertain how the animals arrived in Lake Erie, but since it is thought that they might have travelled from China to Europe in the ballast tanks of a ship, it is entirely possible that they may have been conveyed to Lake Erie in a similar fashion. Since the Welland Canal was opened only fifteen days before the first crab was captured, it is likely that the animals may have successfully over-wintered in Lake Erie.

The mitten crab was considered a serious pest in Germany in the 1920s and 1930s when it caused extensive erosion and undermining of river banks through its habit of borrowing in the banks. However, recent reports indicate that the crabs are not as abundant as previously and are no longer considered to be a serious problem.

As this animal needs marine or brackish water to propagate, it is unlikely that a breeding population could establish itself as far inland as Lake Erie or the upper lakes. However, accidental introduction to an estuarine system, such as the mouth of the St. Lawrence River, might permit the species to become established in North America. The St. Lawrence River is particularly vulnerable in this respect because of its great international shipping traffic. If mitten crabs should become established in the St. Lawrence, an invasion as far inland as Lake Ontario would not be impossible.



Rabbits must eat, but cover is all-important. *Photo by T. Jenkins.*

WHERE TO FIND COTTONTAIL RABBITS IN ONTARIO

by D. G. Watton
Mammalogist, Wildlife Branch

GREAT balls of fur! Well, maybe not so great in size, but any one familiar with our native cottontail rabbit knows that its talents greatly exceed those necessary just to deliver eggs at Easter. Its name is derived from its white fluff of a tail.

FIELD IDENTIFICATION

Cottontails, scientifically named *Sylvilagus floridanus,* are not rodents but are grouped with hares in the order Lagomorpha. The cottontail is Ontario's smallest lagomorph, averaging three pounds as opposed to weights of four and nine pounds, respectively, for the varying hare and the European hare (jackrabbit). Its shorter ears and legs also help to distinguish it from its relatives.

Cottontails do not change to white in winter as do the varying (or snowshoe) hares. Their general coloration is buff with most hair being tipped with grey or black. Some areas of the body, notably the neck and upper tail, display patches of brownish hair. The feet are whitish, and the undersides are light grey-brown.

LIFE HISTORY

Life may seem harsh for this bunny since everything from owls and hawks to man are its predators. If this were not so, however, we would be quickly overrun with rabbits since one female, by having two or three litters of four to seven young, is capable of producing more than 20 new rabbits per year. For the cottontail, the best defence (against predation) is good offence (reproduction). Research has shown that up to 80 per cent of the rabbits present in early fall are no longer present in late winter.

Young cottontails are raised in fur-lined, grass-covered nests which are usually located in grassy fields. They are naked, blind and deaf at birth but develop very quickly. Their eyes open at the age of one week, and many are ready to leave the nest after two weeks.

The activity of rabbits hits a peak at dawn and dusk; these periods are feeding times for the young as well.

In summer, acceptable cottontail food is everywhere. Herbaceous plants, such as clovers, alfalfa and bluegrass, are favourite items. Garden and horticultural crops provide a banquet for cottontails. The bark of trees and shrubs, especially sumac and raspberry stems, rate highly as winter food.

The most important disease of cottontails is tuleremia which always kills the infected rabbit. Tuleremia is a bacterial disease of the organs, and an infected animal can usually be identified by minute white spots on the liver and spleen. Since tuleremia can be transmitted to man, any cottontail that is sickly or sluggish should not be handled by humans.

LOCATING COTTONTAILS

Cottontails can be found in nearly all farmland in southern Ontario, but they find some areas more acceptable than others. Cover is all important. Where good cover and good food are found in close association, many cottontails should be expected. Abandoned farmland, where young trees and bushy shrubs are growing in old fields, can be excellent for cottontails.

In winter, fencerows, old buildings, brush piles and junk heaps all afford good cover. Orchards and small cover-filled waterways near fields and woodlots can also be winter 'hot spots'. If snow gets deep, willow thickets and sumac stands supply food, and the bunny may be surprised while feeding there.

VIEWING AND HUNTING

Fresh snow presents a good opportunity to track these animals, and much can be learned of a cottontail's habits by following its wandering trail for a few hours.

If the weather is very cold, many rabbits will seek the protection and warmth of an old groundhog den. During cold days and on warmer days following a cold snap, look

Great balls of fur! A baby . . . so small but what a potential !

for them on the sunny southward-facing hill slopes. This form of rabbit watching may even be done while travelling by car.

Cottontail hunting is at its best when good dogs (beagles are favourites) join the hunt. The small rabbits have small home ranges and, consequently, usually circle back to (or near) the spot where the dogs first found the trail. A wise hunter will stay put, relax, listen to the music of the hounds, and wait for the rabbit to come to him.

The cottontail may be hunted with many types of guns, but the 12-gauge open bored shotgun is used most often. Light shot (No. 6 or smaller) is best. The .22 rifle is a favourite with many rabbit hunters.

Most of southern Ontario is good rabbit habitat, and the Niagara Peninsula is probably the best area in the Province to view or hunt cottontails.

To learn cottontail habit

Evening Grosbeaks
at window feeder

Photographs by
D. J. Haddow

Red Crossbill
at window feeder